



U.S. Department
of Transportation
**Federal Highway
Administration**

February 26, 2007

400 Seventh St., S.W.
Washington, DC 20590

In Reply Refer To:
HSSD/WZ-242

Mr. Chris Goode
Vice President of Sales
Bone Safety Signs
2151 Northwest Parkway, SE - Suite 100
Marietta, GA 30067

Dear Mr. Goode:

Thank you for your correspondence requesting the Federal Highway Administration (FHWA) acceptance of your company's SZ-412-2S Portable Sign Stand with 48 x 48 inch, 0.080 inch thick solid aluminum signs for use in work zones on the National Highway System (NHS). Accompanying your letter was the FHWA Office of Safety Design form you completed and a DVD compilation of relevant crash tests. You requested that we find this sign stand acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

This letter is the acknowledgement of the FHWA's acceptance of your request. The results of the testing met the FHWA requirements, and therefore, the device detailed in the enclosed drawing is acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

A PDF version of your completed form has been modified by the addition of the FHWA acceptance letter number and the date of our review. The form, of which a copy is enclosed for reference, will be posted to our Web site in the near future. Please note that future submissions must include an electronic copy of the form that may be edited, plus a hard copy signed by the engineer *from the crash test laboratory*.

Thank you for working with us as we institute this new review and acceptance process.

Sincerely yours,

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures



Page 1	FEDERAL HIGHWAY ADMINISTRATION OFFICE OF SAFETY DESIGN Category 2 Work Zone Device Acceptance Letter	Letter Number : <i>WZ-242</i>
		Date <i>2/14/07</i>
Contact Info	Petitioner / Developer Name and Address:	
	Bone Safety Signs c/o Chris Goode 2151 Northwest Parkway SE, Ste 100 Marietta, GA 30067	
	I hereby certify that the device(s) covered by this Acceptance Letter meet(s) the crash - worthiness test and evaluation requirements of the FHWA and NCHRP Report 350.	
Signature	<i>Chris Goode</i>	
Telephone #	770-333-1635	
Email Address	chris@bonesafety.com	
	Laboratory / Engineer Name and Address	
	Karco Engineering LLC 9270 Holly Road Adelanto, CA 92301	
Check One:		
<input checked="" type="checkbox"/>	I hereby certify that the testing that supports this Acceptance Letter was conducted in accordance with NCHRP Report 350 guidelines, that the device(s) tested is/are accurately described on this form, and that the test results indicate that the device meets all applicable NCHRP Report 350 evaluation criteria.	
<input type="checkbox"/>	I have evaluated the requested modifications to these devices previously found acceptable by the FHWA in Acceptance Letter WZ-___, and hereby certify that, in my opinion, the modifications do not adversely affect the crash performance of the devices. I also certify that these devices are accurately described on this form.	
Signature	<i>Chris Goode</i>	
Telephone #	770-333-1635	
Email Address	chris@bonesafety.com	
Keywords:		
	Type of Device (See page 3)	
	X Foot Print Sign Stand	
	Composition of Sign or Rail substrate (See Page 3)	
	Aluminum - Solid	
	Thickness of substrate (inches): .080	
	Height of sign from the ground (inches), if applicable: (See Page 3)	
	Low 12-18	
	Flags and or lights present during test? Indicate number of each:	
	# of flags: 2	# of lights: Weight of lights: ea.
Device Name	SZ412-2S Rigid Sign Stand	
Detailed Desc. Of Device, Materials, sizes, Fasteners, Substrates Foundation, Aux. Features Ballast, etc.	(May be attached on separate page(s) Attached in Karco Report	

Page 2	FEDERAL HIGHWAY ADMINISTRATION OFFICE OF SAFETY DESIGN Category 2 Work Zone Device Acceptance Letter		Letter Number WZ-242
			Date 2/14/07
	Mandatory Attachments		
	Attachment # 1: Test data summary page(s)		
	Attach. #1a	Test # 3-71	
	Attach. #1b	Test #	
	Attach. #1c	Test #	
	Attach. #1d	Test #	
Alternative	Attachment # 1: Description and discussion of modification(s) to crash tested and/or accepted device.		
	Date:		
	Attachment # 2: PDF drawing(s) of device(s)		
	Attach. #2a	Drawing Title: Manufacturer's Drawing of Test Article	
		Drawing #: Figure 1	
	Attach. #2b	Drawing Title:	
		Drawing #:	
	Attach. #2c	Drawing Title:	
		Drawing #:	
	Attach. #2d	Drawing Title:	
		Drawing #:	
	Attach. #2e	Drawing Title:	
		Drawing #:	
	Attach. #2f	Drawing Title:	
		Drawing #:	
	Attach. #2g	Drawing Title:	
		Drawing #:	

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Please select from the following Keywords for “Type of Device”:

Longitudinal Channelizing Barricade
 Curb (Curb channelizer system with or without road tubes or other channelizers)
 Drum
 H-Footprint Sign Stand
 X-Footprint Sign Stand
 Trailer Mounted Signs (Does not include arrow boards or variable message signs or other Category 4 trailer mounted devices.)
 Automated Flagger Device (not trailer mounted)
 Tripod Sign Stand
 Type I Barricade
 Type II Barricade
 Type III Barricade
 Vertical Panel
 Intrusion Detector
 Ballast (Action relates to ballast on one or more devices)
 Channelizer (Individual units unlike cones, road tubes, or drums)

Please select from the following Keywords for “Sign Substrate”:

Roll-up / Fabric (with fiberglass spreaders – aluminum or steel spreaders are not allowed.)
 Plywood
 Aluminum – Solid
 Aluminum – Laminate
 Corrugated Plastic
 Extruded Plastic
 Waffleboard Plastic
 Wood / Lumber

Please select from the following Keywords for “Height of Sign”:

The distance to the lowest point on the sign is:

Low	12 to 18 inches above the pavement
Mid-A	20 to 24 inches above the pavement
Mid-B	25 to 36 inches above the pavement
Mid-C	37 to 59 inches above the pavement
Tall	60 to 71 inches above the pavement
Oversized	72 inches and taller

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Please note the following standard provisions that apply to FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, or conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- If the subject of this letter is a patented device it is considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are *selected by the contractor* for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are *specified by a highway agency* for use on Federal-aid projects they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.
- This Acceptance Letter shall not be construed as authorization or consent by the Federal Highway Administration to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The Acceptance Letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

**DATA SHEET NO. 3
SUMMARY OF RESULTS FOR TEST NO. 3-71**



GENERAL INFORMATION		OCCUPANT RISK VALUES	
TEST AGENCY	KARCO ENGINEERING	FLAIL SPACE VELOCITY (m/sec)	
TEST NO.	3-71	X-DIRECTION	
DATE	12/15/2005	Y-DIRECTION	
TEST ARTICLE		THIV (optional)	
TYPE	Bone Safety 412 2S Spring Loaded 4X4 Sign Stand	RIDEDOWN ACCELERATION (g's)	
INSTALLATION LENGTH (m)		X-DIRECTION	
SIZE AND/OR DIMENSION OF KEY ELEMENTS		Y-DIRECTION	
SOIL TYPE AND CONDITION	CONCRETE	PHD (optional)	
TEST VEHICLE	820C	ASI (optional)	0.11
TYPE	PRODUCTION	TEST ARTICLE DEFLECTIONS (m)	
DESIGNATION	3-71	DYNAMIC	
MODEL	GEO METRO	PERMANENT	
MASS (CURB)	804 (1772 lbs)	VEHICLE DAMAGE	
MASS (TEST INERTIAL)	820 (1808 lbs)	EXTERIOR	
DUMMY(s) MASS	75 Kg (165 lbs)	VDS	12-FD-1
GROSS STATIC WEIGHT	897 (1978 lbs)	CDC	12FCMN2
IMPACT CONDITIONS		INTERIOR	
SPEED (km/h)	103.6(64.39 mph)/ 103.8(64.48 mph)	OCDI	FS0000000
ANGLE (Deg.)	90 / 0		
IMPACT SEVERITY (kJ)	340	POST IMPACT VEHICULAR BEHAVIOR	
EXIT CONDITIONS		MAXIMUM ROLL ANGLE (Deg.)	-5.8
SPEED (km/h)	98.35 (61.11 mph)	MAXIMUM PITCH ANGLE (Deg.)	-6.1
ANGLE (Deg.)	90 / 0	MAXIMUM YAW ANGLE (Deg.)	-4.1

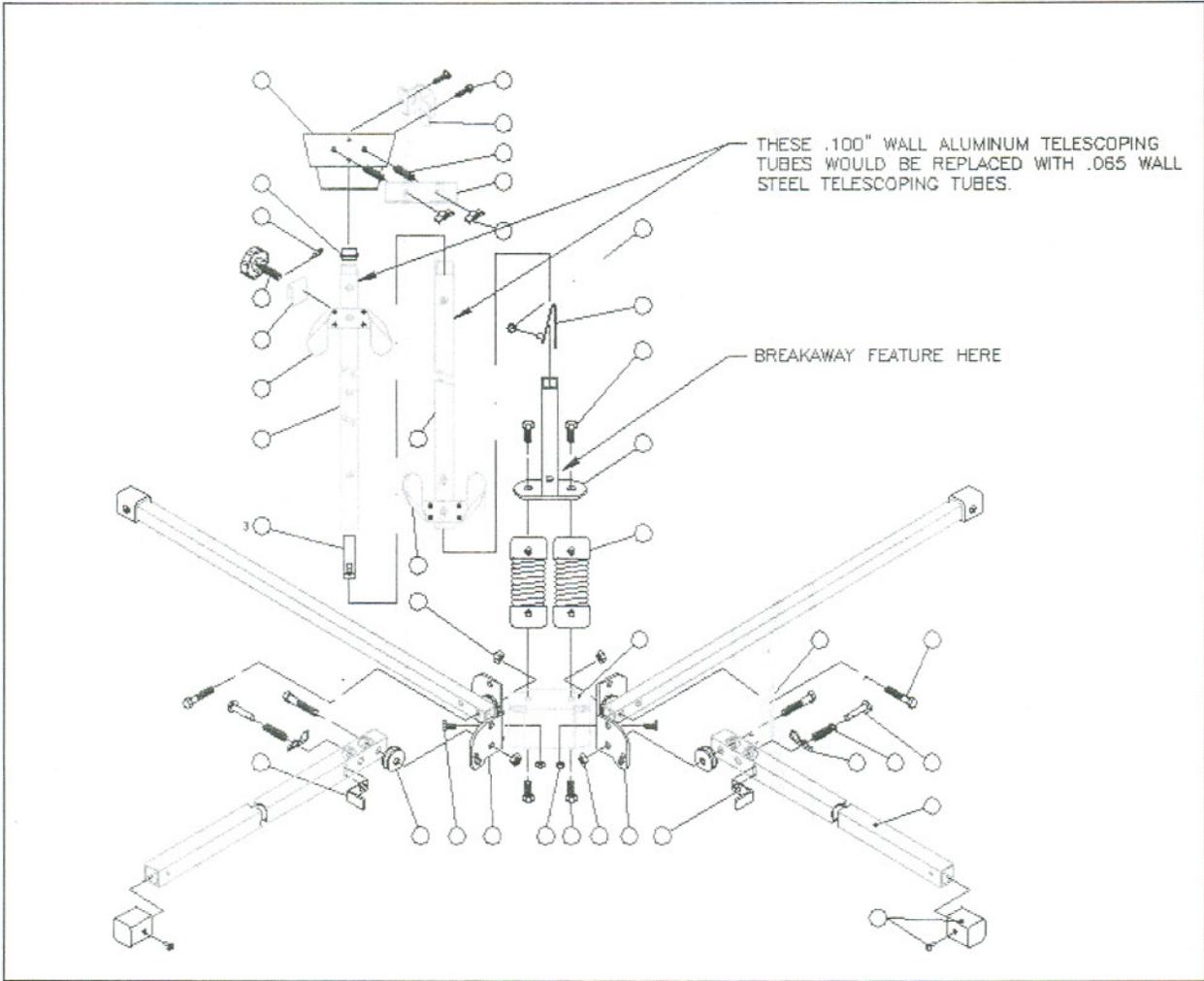


FIGURE 1: MANUFACTURER'S DRAWING OF TEST ARTICLE

Specifications for the SZ-412-2S:

Folded Dimensions:

HEIGHT	47.25"
WEIGHT	31 LBS. (37 LBS. w/mast and brackets)
AREA	7" x 11.25" x 47.25"
STORAGE	2.15 cubic feet

Deployed:

HEIGHT W/ Flags	108"
TOP OF SIGN	82"
BOTTOM OF SIGN	14"

Foot Print:

FRONT	38.5"
SIDE	89"

Springs:

Cylinder, Close Wound, Oil Tempered, Class II, Round

Frame:

UV stabilized powder coated tubular steel frame with nut and bolt construction, mast made of anodized thick wall aluminum or a thin wall 0.065 and 0.083 tubular steel with the same tensile and elongation characteristics, which is a two piece, two position mast.

Brackets:

The steel frame has an adjusting knob along with a 5/8" opening to accept 0.10" aluminum to plywood; top mounted 3 position flag bracket.